8:Campbell T-5 (no date) 1949 MH1 Iraq MH1

TALES FROM THE ARAB TRIBES

1. The Story of Hajji Ali, the Great Sultan and his Son, the Amir Kheyyun

The Maadan. Page 12, Line 17. 'The Maadan shall bring milk.'

The Maadan are in the main a tribe of poor families, living in scattered communities on the shores of that great area of marsh and lake which lies between the Tigris and the Euphrates before the two rivers finally join to form the Shatt el Arab. Maadan villages often acknowledge the authority of sheikhs of neighbouring tribes, and they have no great tradition of their own. Their chief source of wealth was in the past their large herds of water buffaloes, their income being derived from the sale of milk and its products, lebn (a kind of curd), and clarified cooking butter. The sale of milk is regarded as shameful by most tribes, though of course all produce enough for their own requirements. In consequence the Maadan, with their trade in milk and hides, are looked down on by the tribes, and they are said to be lacking in honour. However in the last twenty-five years the Maadan have acquired large areas of agricultural land, and they are sharing fully in the increasing wealth of South Iraq. As for their honour, I remember a fight three years ago which took place between two Maadan subsections not far from Qarmat Ali, just outside Basra. This was a fight for a woman's honour in the best tribal tradition in which nothing was lacking either in the number of rounds of ammunition expended or in the casualties to bring it fully up to the standard of the great tribes in these matters.

2. A Story Concerning the Ignorance of Slaves

Slaves.

'Abd, or slave, is a slang expression in South Iraq for a Negro, and does not now indicate an actual slave. Slavery continued in Iraq to the end of Ottoman rule, 83 years after its abolition in the British Empire. In this story, therefore, the word would refer to actual slaves, and I have so translated it. The word 'habshi' (lit. 'Abyssinian') is little used in South Iraq, a Negro being referred to as a 'sambo' or 'abd'.

Crocodile. Page 20, Line 3. 'In that river was a crocodile.'

The word used was 'timsah', or crocodile, of which of course there are none in Iraq. I do not know if this indicates that this story

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originates from Africa, possibly as one told by Negroes themselves. There are sharks in the Shatt el Arab and in the Karun River in Arabistan which occasionally take off the leg of a bather as far as eighty miles from the sea and the shark is far better known to the Iraqi than is the crocodile.

4. THE STORY OF THE PRINCE OF KERMANSHAH AND OF HIS MISFORTUNES

Peacock. Page 29, Line 25. 'A thousand peacocks.'

I think this bird is only included to give an exotic flavour to the feast. I remember once mentioning that I had shot and eaten peafowl in the Punjab, a statement which was received with much surprise and, I am afraid, some lack of belief, and on a subsequent occasion when someone was describing a feast one of those present shouted, 'Put in a peacock for the Sahib'. In India the peacock is not normally killed by Moslems on the grounds that it is a bird of Paradise. In Iraq, however, I do not doubt that the learned doctors of religion could give the answer straight away if asked. Pigeons which roost on mosques are exempt from molestation, even when destroying crops outside villages. There is incidentally a pretty Iraqi story which explains the large feet of a pigeon. It describes how the pride and arrogance of peacocks offended King Solomon, so to punish them he took away their feet and gave them the feet of the pigeons, that they might always be shamed by their smallness, while the peacocks' large and beautiful feet he gave of course to the pigeons.

5. THE STORY OF THE YOUTH JAMIL, THE SON OF A MERCHANT IN BAGHDAD

Page 43, Line 3. 'The City of Peace.'

Medinat es Salaam or 'City of Peace' is one of the names used in poetry for Baghdad. The city, when first built, was originally named Medinat es Salaam, but it appears that people persisted in referring to it as Baghdad, or Dad's Garden, from some older name for the site of the present city. Arabs love these poetical names, differing from those in normal use. Iraq is sometimes known as Bilad er Rafidain, or Country of the Two Rivers, Jerusalem (Al Quds or the Holy in

364 erve as latrines, while the use of the banks of streams or canals facilitates the ablutions required by Moslem rites. Frequent pollution of the water supplies promotes the spread of intestinal infections, which are prevalent among all groups of the population.

Fauna and Flora

136 164 **Arthropods. Mosquitoes.** Twelve species of anopheline mosquitoes have been recorded from different parts of the country, but the majority are regarded as of minor significance. Four species are of major interest in the transmission of malaria. 136 *Anopheles stephensi* is the primary vector throughout southern Iraq. *A. sacharovi* (— *A. elutus*) and *A. superpictus* are the principal vectors in the north, while *A. maculipennis maculipennis* is implicated in localized areas in the higher mountain valleys. *A. pulcherrimus* is widespread, particularly in the southern provinces, but is of doubtful importance in transmission. Other species, which are present to a varying extent in diverse localities, are *A. claviger*, *A. hyrcanus*, *A. multicolor*, *A. d'thali*, *A. fluviatilis*, *A. algeriensis* and *A. marteri*.

A. stephensi, the chief vector species in the south, is abundant in the irrigated date-growing areas along the Shatt al Arab and in the alluvial plains region, particularly in the Euphrates basin. It also occurs in various foci in the Tigris valley along the middle course of the river and in the Diyala basin to the edge of the foothills, as well as in the spring-fed oasis of Shifathah, in the desert west of Kerbela. It breeds in vegetated irrigation canals, seepage pools, borrow pits, shallows wells, hoofprints and other temporary collections of water. The larvae are found in greatest numbers from May to October, although breeding takes place throughout the year in the Gulf area. The prevalence of this species has increased appreciably within the last few decades, paralleling the expansion of irrigation facilities. At present it is the only proven vector in the Shatt al Arab and the lower delta areas.

63:Simmons et al G-8 (1941-1961) 1964
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A. sacharovi was common in the tidal creek zone of the Shatt al Arab until 1947, but it has not been found since that date, possibly in part as the result of control operations which have been carried on in the vicinity of Basra. 136

A. sacharovi is probably the most dangerous vector of malaria in the steppe and the foothill regions. It exists in association with *A. stephensi* in the Diyala basin: occasionally it invades areas as far south as Baghdad, but it does not normally encroach on the alluvial plain. Throughout most of its northern range it shares the role of vector with *A. superpictus*. It breeds in irrigation seepages, along the grassy margins of sluggish canals, in the rice fields and sometimes in small streams overgrown with vegetation. It is plentiful from March to May and appears again in some numbers in October.

A. superpictus is widely distributed in the northern provinces and is the dominant vector in the mountain and the escarpment districts. It breeds not only in the numerous small, sunlit watercourses and gravelly stream beds, but also in the rice fields and other habitats. It is active from May to October, with a peak of prevalence in August and September.

A. maculipennis maculipennis is reported from the mountain districts along the Iranian frontier, where it replaces *A. sacharovi* as a vector. *A. pulcherrimus* is widespread from the Persian Gulf to the beginning of the foothills. It is found primarily in the south, decreasing in prevalence from the alluvial plain northward. This species probably has little or no direct part in malaria [164] transmission, but the predominance of its larvae over those of other anophelines in the marshes and the rice fields of the alluvial plain suggests that it may exert a restraining influence on the establishment of *A. stephensi* and other species in such habitats.

Several species of *Aedes* are encountered, 136 among which *A. caspius* is most abundant. 164 *A. aegypti* occurs in some sections of the

southern provinces and has been held responsible for sporadic outbreaks of dengue fever. It is also a potential vector of urban yellow fever, although that disease is not reported from this region. Many varieties of Culex mosquitoes have been recorded, but none has been specifically implicated in the transmission of disease. *Culex quinquefasciatus* (— *C. fatigans*) or *C. pipiens* (each a potential vector of *Wuchereria bancrofti*) is present in most areas.

Within recent years extensive mosquito control work has been undertaken by municipal and government authorities, by the oil companies and, during World War II, by the British Expeditionary Forces. The problem is stupendous, involving the improvement and the regulation of the irrigation facilities on which the agricultural economy of the country depends. In 1947, malaria control was first attempted on a nation-wide basis with the creation of an antimalaria service within the Iraqi health organization. Since that date, control operations have been carried on in various highly endemic areas. Depending upon local conditions, they have included antilarval measures, drainage works and residual spraying of the rural villages with DDT preparations. In 1952, a demonstration DDT house-spraying program was initiated in the hyperendemic Tanjero Valley of Sulaimaniya *liwa* (province), in conjunction with the World Health Organization.

FLIES. Flies are prevalent in all parts of the country. Numerous species of MUSCIDAE are encountered, many of which are implicated in the mechanical transmission of intestinal and eye diseases. *Musca sorbens* apd *M. domestica vicina* are most frequently incriminated, but *M. tempestiva*, *M. vitripennis* and *M. mesopotamiensis* are also abundant. The larvae of *Fannia canicularis* sometimes cause myiasis in the livestock. The stable fly, *Stomoxys calcitrans*, is almost ubiquitous. At least 22 species of *Tabanus* are recorded, and many local authorities believe that they are involved in the mechanical transmission of anthrax.

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136 Several species of *Chrysops*, including
164 *C. punctifera*, are known to be present.
232 Among the myiasis-producing flies which attack animals, and incidentally man, the most numerous are *Chrysomyia albiceps*; the blow fly, *Calliphora erythrocephala*; the green-bottle fly, *Lucilia sericata*; the horse bot fly, *Gasterophilus nasalis*; the sheep bot fly, *Oestrus ovis*; and the flesh fly, *Sarcophaga hirtipes*.

136 At least 12 species of sandflies are found.
164 They are serious pests and may produce a form of dermatitis in susceptible individuals. The most widespread species is *Phlebotomus papatasii*, the vector of sandfly fever throughout this area. *P. sergenti* is abundant in the central and the southern provinces and in sections of the northern. It transmits cutaneous leishmaniasis and is apparently the only vector in Iraq, although *P. papatasii* is also implicated in adjacent territories. Potential vectors of kala-azar may be present in the northwest, but the disease is almost never reported.

Several species of SIMULIDAE occur in the hilly districts. The biting midge, *Leptoconops mesopotamiensis*, is an annoying pest.

LICE. All 3 species of human lice, *Pediculus humanus corporis*, *P. humanus capitis* and *Phthirus pubis*, are common, especially among the poorer sections of the population. *P. humanus corporis* is important as the vector of louse-borne typhus and louse-borne relapsing fever, both of which are endemic.

136 FLEAS. The only flea of primary medical
164 importance is the Oriental rat flea, *Xenop-*
232 *sylla cheopis*. It parasitizes the rats and other rodents and is the vector in sporadic outbreaks of murine typhus and plague. The human flea, *Pulex irritans*, and the cat and the dog fleas, *Ctenocephalides felis* and *C. canis*, are plentiful in most areas.

136 BEDBUGS. The bedbug, *Cimex lectularius*, is indigenous. The tropical species, *C. hemipterus*, is frequently encountered in Baghdad, Basra and other cities, but is seldom seen in the rural villages.

600 TICKS AND MITES. Numerous species of

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TICKS AND MITES. NUMEROUS SPECIES OF ticks infest the livestock, including *Rhipicephalus sanguineus*, *Hyalomma dromedarii* and *Haemaphysalis cinnabarina punctata*. *Ornithodorus tholozani* occurs in many localities, and is the vector in sporadic cases of tick-borne relapsing fever. *O. savignyi* is present in the desert areas. The fowl or blue Persian tick, *Argas persicus*, and the castor bean tick, *Ixodes ricinus*, are widespread.

The itch mite, *Sarcoptes scabiei*, is prevalent, especially in the congested urban communities and rural villages. The grain itch mite, *Pediculoides ventricosus*, is a frequent pest in the grain-growing districts.

SCORPIONS AND SPIDERS. Scorpions are common, particularly in the northern provinces. The most dangerous species are *Buthus australis* and *B. crassicauda*. *B. europaeus* is also present. A few deaths from scorpion stings are reported each year, usually among young children or old people. *Scorpio maurus kruglovi* is sometimes encountered in the plains and *S. maurus townsendi* in the Persian Gulf region. The principal poisonous spider in Iraq is *Lycosa tarantula*.

OTHER ARTHROPODS. *Reduvius tabidus* and *R. annulipes* are found in many areas. The "date beetle," a large aquatic species of the family BELASTOMIDAE, is capable of causing serious bites.

Reptiles. Twenty-six species of snakes have been recorded from Iraq, but only 5 land varieties are venomous. Casualties from snake bites are reported occasionally. A large proportion of the fatalities is probably caused by the Levantine or blunt-nosed viper, *Vipera lebetina lebetina*, which inhabits the northeastern highlands from north of Baghdad to the Turkish and the Iranian frontiers. *V. lebetina euphratica* is also seen in some localities. The horned viper, *Aspis cerastes* (=*Cerastes cornutus*), is native to the alluvial plains, while the carpet viper, *Echis carinatus*, is found in limited areas in Diwaniya province. The hoodless cobra, *Naja morgani*, is widely distributed but apparently is rare. The poison-

ous sea snake, *Enhydrina zhistosa*, roams the Persian Gulf and the Shatt al Arab. Although it may be dangerous to fishermen, no fatalities are known to have occurred.

Rodents. *Rattus rattus frugivorus* is the rat most frequently encountered in Iraqi dwellings. *R. rattus alexandrinus* is also indigenous, while *R. norvegicus* is present in Basra, Baghdad and the river towns. *Nesokia buxtoni*, *Dipodillus dasyurus* and *Meriones charion* are reported from different localities. Rats are often captured in Baghdad and Basra and examined for evidences of plague, but otherwise little rodent control work is undertaken, except at the time of plague outbreaks.

Molluska.* *Bulinus truncatus* (— *B. contortus*), the intermediate snail host of *Schistosoma haematobium*, is found in numerous foci in central and southern Iraq, where pump or gravity flow irrigation is employed. It inhabits the many small and sluggish irrigation canals and the rice fields, borrow pits, marshes and other suitable collections of water, but is strictly seasonal in appearance, being abundant only in the summer and the fall months, from May or June to November. The snails are widespread in Basra, Muntafiq, Diwaniya and Amarah provinces in the south, but are absent from the Shatt al Arab region south of Basra, where breeding is restricted by the salinity of the water. They are more scattered in distribution in the central provinces and practically nonexistent in the north, aside from localized foci around the marshlands of the Mosul area. *Radix lagotis canaliculata*, a vector of *S. turkestanicum* which causes serious infections among the livestock, is found in the rice fields and the marshes of the southern delta.

The threat of the spread of *Bulinus truncatus*, and subsequently of schistosomiasis, with the expansion of irrigation creates a problem which is of major public health and economic importance to the country. Small-scale snail-control campaigns have been undertaken in the past in Baghdad, Basra and

* See footnote, page 10.

Diwaniya provinces. In 1949, a co-ordinated control program was introduced by the Iraqi government, and a Bilharzia Section was established within the national health organization. The section initiated a snail survey in the various endemic foci and research on the most effective methods of snail control. It carries on continuous snail destruction work through special units assigned to each of the infected provinces.

Plants. Little precise information is available regarding the prevalence of allergy-producing plants, but numerous weeds, grasses and trees, which have been incriminated in other countries, are present in districts with rainfall adequate to support such vegetation.

Occasional deaths, primarily among young children, have been traced to the consumption of the raw beans of *Vicia faba*, a prominent food crop throughout this region. The beans are toxic to susceptible individuals in the raw state. Plants of the *Senecio* group grow in sections of the northern highlands. The young green shoots are poisonous and sometimes cause fatalities among the livestock.

Food Sanitation

The government and municipal health authorities are responsible for the enforcement of regulations governing the sanitary quality of foods, meats and milk products, but the degree of enforcement varies in different localities. Health inspectors are charged with the supervision of establishments where foods are prepared or sold, such as foodshops, markets, restaurants and cafés, mineral-water bottling works and date-packing houses. Examinations for the presence of venereal diseases are theoretically required at regular intervals in the case of cooks and barbers, but no tests to detect other infections are carried out.

Meat animals are inspected before and after slaughter in the city abattoirs by officers of the government veterinary and health services. All carcasses offered for sale are supposed to bear an official stamp of

164 parently of primary importance in all parts of the country, particularly in the lower delta region. Local authorities estimate that 25 to 35 per cent of the inhabitants in Baghdad harbor cysts of *Endamoeba histolytica*, while in Basra the carrier rate probably approximates 60 to 70 per cent. Liver abscesses are frequently encountered.

The actual distribution of bacillary infections is unknown, since the proportion of cases treated by medical officers is unduly small, and few facilities for confirmatory diagnosis are available. According to the official statistics for 1944 through 1949, from 17,000 to 30,000 cases of amebic dysentery and from 180 to 1,100 cases of bacillary dysentery were reported each year. Correspondingly, an analysis of the cases treated annually in the hospitals and the dispensaries of the Iraq Petroleum Company in the Kirkuk oil field and pipeline areas, in the 4 years 1946-50, shows that from 478 to 1,603 were amebic infections and from 58 to 175 bacillary. The Flexner group predominates among the *Shigella* strains isolated in dysentery cases at the Royal Hospital in Baghdad, but Sonne, Schmitz and Shiga types are also numerous.

136 The abundance of flies and the insanitary
515 habits of the people favor the spread of
164 intestinal infections. Diarrhea and enteritis
165 are major causes of illness and death, especially in early childhood. Giardiasis is common. Outbreaks of food poisoning, undoubtedly caused by various strains of *Salmonella*, are frequent.

164 Cholera. Epidemics of cholera were for-
484 merly recurrent in the border districts and along the trade routes from India and the East. Although some authorities believe that an endemic focus may have existed in the Shatt al Arab region in the past, most epidemics have resulted from the introduction of the disease by way of traffic through the Persian Gulf ports or by overland travel through Iran, often in connection with pilgrimages to Mecca or local Shia shrines.

164 Within recent decades extensive outbreaks, each totaling from 1,500 to 2,500 cases,

were reported in 1923, 1927 and 1931. Since 1931, cholera has been almost completely absent from the country, although one imported case was recorded in 1939, when the disease was epidemic in Afghanistan and Iran. 164

Strict quarantine regulations are enforced, and travelers from India, Pakistan and Ceylon, as well as pilgrims from Mecca, without valid certificates of immunization against cholera are retained in quarantine centers for a period of 7 days. Mass immunization with cholera vaccine is carried on among the populations in the border provinces whenever epidemics are reported from the adjacent territories. At the time of the recent epidemic in Egypt, in 1947, immunization was compulsory for all travelers entering the country and for the inhabitants of towns and villages along the Syrian frontier. 744 484 164 751 164

Helminthiases. SCHISTOSOMIASIS. Schistosomiasis, caused by *Schistosoma haematobium*, has probably been present in the lower Tigris and Euphrates river basins since ancient times. It is highly endemic in the southern and the central provinces, where the intermediate snail host, *Bulinus truncatus*, is found in widespread but often localized foci. The disease is prevalent among the children and among the agricultural and other laborers who work in infested waters, particularly the men and the boys, who are exposed to infection to a greater extent than the women. It reaches maximum proportions between 10 and 30 years of age, but is usually negligible in early childhood. Transmission is seasonal: it takes place from May to the end of November, but primarily between June and October, when infected snails are most abundant. The insanitary customs of the inhabitants, associated with the frequent use of the canals for religious ablutions and the severe summer heat which is conducive to bathing in any convenient body of water, are contributory factors. The infection rates average 18 to 25 per cent in the irrigated districts of the delta, but vary from zero 164 136 164 462 164 515 164 361

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164 provinces, and conducts research and field
462 investigations on the distribution and the
312 control of the disease and the intermediate
744 snail host. In the 7 years 1944-50, from 15,800 to 27,300 persons were treated annually in government hospitals and dispensaries. The disease is considered commonplace in most areas, however, and probably not over 5 to 6 per cent of the infected individuals seek treatment under ordinary conditions. Since 1949, special dispensaries have been established in Baghdad, Basra and Kufa, while mobile clinics tour the most seriously infected districts. In 1950, there were 11 mobile units for the treatment of schistosomiasis, malaria and hookworm infection among the rural populations.

164 ANCYLOSTOMIASIS. Ancylostomiasis is
361 widespread in the irrigated areas, but the exact distribution and severity of the infection in the different provinces are not accurately known. *Ancylostoma duodenale* is the only species found in the foci studied. The infection rates are generally estimated at 10 to 20 per cent in the northern provinces and at 40 per cent in the southern. They are especially high in the Amarah and the Al Qurnah regions, but decrease toward the south, and are relatively low in the districts along the Shatt al Arab. In a study reported in 1939,[47] fecal specimens from apparently healthy men, 18 to 20 years of age, from various parts of the country were examined for hookworm ova. The presence of ova was detected in 25 per cent of the specimens from 125 men from Baghdad and in 46 per cent from 135 men from the rural districts of Baghdad *liwa*. Comparable examinations revealed ova in the specimens from 26 per cent of the individuals examined from Diyala *liwa* and from 25 per cent of the individuals from Dulaim. The degree of infection is usually mild, but serious cases with hemoglobin indices as low as 10 per cent are not infrequent.

164 Treatment facilities are provided by the
759 schistosomiasis control units, as well as by
742 the government hospitals and dispensaries.

[136]

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An ancylostomiasis section is incorporated in the Department of Endemic Diseases, and a program for the improvement of rural sanitation is being developed by the health authorities.

OTHER HELMINTH INFECTIONS. A large proportion of the inhabitants harbor one or more types of intestinal worms. Ascariasis predominates in the northern and the central provinces. Heavy infections, often with intestinal obstruction, are common. In the studies made on groups of men of 18 to 20 years of age, as indicated above, ova of *Ascaris lumbricoides* were found in the fecal specimens from 10 per cent of the 125 individuals examined in Baghdad city. In the provinces, ova were detected in fecal samples from 9 per cent of 135 persons from Baghdad, from 15 per cent of 145 persons from Dulaim and from 13 per cent of 309 persons from Diyala.

Enterobiasis, trichuriasis and, to a lesser extent, strongyloidiasis are prevalent. *Trichostrongylus*, a parasite of sheep and goats which sometimes infects man, is widely distributed in the Shatt al Arab region. Infections with the dwarf tapeworm, *Hymenolepis nana*, are numerous. The beef tapeworm, *Taenia saginata*, is often encountered, but not as widely as in Syria and other Arab countries where more raw meat is customarily consumed. The pork tapeworm, *T. solium*, is occasionally observed in the Christian communities.

Hydatid disease is endemic, especially in the central provinces. Stray dogs are numerous and serve as primary reservoirs of infection. In a survey published in 1940,[46] adults of *Echinococcus granulosus* were found in 18 per cent of 123 street dogs examined in Baghdad. Hydatid cysts were seen in the carcasses of 12 per cent of 2,347 sheep and goats slaughtered in the municipal abattoir and in 25 per cent of 223 cattle.

Other Infections. Brucellosis is enzootic among goats, sheep and cattle, and sporadic human infections result from the consumption of cheese, *leban* and other unboiled

164 prevalent. In most areas the prominence of eye lesions is aggravated by the frequency of dust-laden winds and by the glare of the sun. Conjunctivitis is the leading cause of morbidity among the employees of the Iraq Petroleum Company in the Kirkuk oil field and pipeline stations. It comprises almost one half of the cases of infectious disease treated each year. Gonococcal ophthalmia is responsible for considerable blindness, par- 943 ticularly in the urban communities. The 164 Ministry of Health operates 3 ophthalmic hospitals and 5 dispensaries in Baghdad and other cities, and provides special facilities for the treatment of eye diseases in the provincial hospitals and dispensaries.

164 **Diseases of the Skin.** The low standards 515 of hygiene prevailing among both urban and rural populations are conducive to the 164 spread of skin infections. Mycotic infections of various types are seen in large numbers. Favus predominates: from 10 to 15 cases constitute the usual daily quota at the clinic of the Royal Hospital in Baghdad. Cases of actinomycosis and Madura foot are often observed. Impetigo and erysipelas are common. Scabies is widespread. Phagedenic ulcers and cases of human myiasis are en- 136 countered from time to time. A form of 164 dermatitis, caused by contact with cercariae of nonhuman strains of *Schistosoma*, is frequent in the southern provinces. The bites of sandflies produce skin lesions in susceptible individuals, and are apt to become infected.

164 **Leprosy.** Leprosy is endemic, especially in the marsh and the lake districts of the south. The actual prevalence of the disease is uncertain, but local observers estimate that it probably does not exceed 400 to 500 cases. From 179 to 279 cases were reported annually in 1944-49, with from 46 to 86 new infections. A focus formerly existed around Baghdad, but within recent years relatively few indigenous cases have been found in the 943 central and the northern provinces. A leper colony is maintained by the government on an island near Amarah: it usually has 250 TO 300 PATIENTS IN RESIDENCE.

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63:Simmons et al G-5 (1941-1951) 1954
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tendances in the hospitals and the dispensaries in 1950, ranged from 26 to 266 per 1,000 population. They approached, or exceeded, the mean rate of 111 per 1,000 in 6 *liwas*, being 106 in Diyala, 111 in Diwaniya, 155 in Erbil, 158 in Sulaimaniya, 205 in Hilla and 266 in Kerbela. While such statistics provide rough indices of the present prevalence of the disease, they contribute little to our knowledge of the extent of the problem. 164

The northeastern mountain districts and the irrigated zones along the Shatt al Arab and the lower Euphrates are the most highly malarious sections of the country. Differences in the average rate of endemicity, as shown by spleen surveys among children 2 to 10 years of age, are indicated on the following map,[41] in which the principal malarious regions are arbitrarily grouped according to the factors governing the transmission of the disease. Malaria is hyperendemic in the date-growing areas along the Shatt al Arab (I), which are watered by a complex system of tidal irrigation. In Basra, Fao, Al Gurnah and the chief towns, the spleen rates approximated 75 per cent in 1941, but were reduced to about 12 per cent by 1949 as the result of control operations. The rate of infection is relatively low in the marshlands of the southern delta (II), where *Anopheles pulcherrimus* predominates, but foci of greater prevalence exist as far north as Qalat Saleh. In Amarah and other towns, the spleen rates are estimated at about 8 per cent. In the lower Euphrates basin (III), the annual flooding of the river and the extensive system of gravity-flow irrigation from high-level canals create conditions favorable to the breeding of the vector species, *A. stephensi*. The spleen rates usually average 30 to 60 per cent, but in controlled localities, as Hilla, Kerbela, Nasiriyeh and Suq ash Shuyukh, they had declined to around 20 per cent in 1950. In the upper Euphrates valley, north of Ramadi (IV), however, irrigation is limited to small-scale projects employing pumps or more primitive meth- 164 361 [136] [312]

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seasonal distribution of the different species of malarial parasites. *Plasmodium falciparum* appears to predominate in most localities with a moderate to high rate of endemicity, as well as during epidemics in all parts of the country. *P. vivax* is also widespread. It is often observed in the blood of infected individuals, even in hyperendemic areas, during the nontransmission season, and the local authorities state that it is unusually difficult to eradicate certain strains in the course of treatment. *P. malariae* is reported more or less sporadically. In certain areas in northern Iraq, it is being encountered with increasing frequency, and some evidence exists that it may be found to take the place of *P. vivax* as the principal species concerned with clinical relapses. Among the 2,865 to 4,281 cases of malaria treated annually in the hospitals and the dispensaries of the Iraq Petroleum Company in 1946 through 1950, from 8 to 53 per cent were identified as *P. vivax* infections, from 0.7 to 7 per cent as *P. falciparum* and up to 8 per cent as *P. malariae*. The remainder were diagnosed on a clinical basis. *P. ovale* was reported recently, but the origin of the infection was obscure. Blackwater fever is rare, although cases are sometimes seen in Basra and in the northern highlands.

Malaria control measures have been carried on in limited areas under the auspices of governmental or other agencies. The Department of Endemic Diseases of the Ministry of Health conducts anopheline control and treatment programs in highly endemic areas throughout the country through subordinate units in central, southern and northern Iraq. A rural health and malaria control project was initiated in the hyperendemic Tanjero valley in Sulaimaniya *liwa* in 1952, in co-operation with the World Health Organization.

Rickettsial Infections. Outbreaks of louse-borne typhus recur almost annually, but are seldom extensive, except under abnormal conditions, as during war periods. The infection is frequently introduced by

361 164 758 164 186 744 164 136 164 680

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THE INFECTION IS FREQUENTLY INTRODUCED BY means of the pilgrimage traffic or tribal migrations from the neighboring territories, and is believed to smolder continuously in the northeastern mountain districts. Cases are usually observed during the winter and the spring months, with the maximum incidence in March and April. Serious outbreaks, with a total of over 1,300 known cases, were reported in 1942-43 in conjunction with epidemics prevailing throughout the entire Middle East. The actual prevalence was probably several times the official estimates. The greatest numbers of cases were noted in Baghdad, and in Basra, Mosul, Diyala and Sulaimaniya *liwas*, along the main routes from Iran. The congestion and the shortage of food, clothing, soaps and other supplies existing in that area as the result of military operations during World War II favored the spread of the infection among the louse-infested populations. About 800 cases of typhus were reported in 1944, but the annual incidence subsequently declined to a low of 72 cases in 1949. No differentiation is made as to type, and the recorded cases include both louse-borne and flea-borne infections. On the basis of laboratory investigations, authorities at the Royal Hospital in Baghdad suggest that many outbreaks in the north, where louse-borne typhus is supposedly endemic, are caused by strains which are serologically intermediate between *Rickettsia prowazeki* and *R. mooseri*. [136]

Murine typhus is endemic, and probably predominates in the rural areas in the absence of a large-scale epidemic. Tick-borne infections are not specifically reported, and are undoubtedly rare. In the event of a typhus outbreak, control measures, including the use of DDT preparations and mass immunization of the inhabitants with antityphus vaccines, are carried on in the affected communities by the government health authorities.

Plague. Epidemics of plague were frequent in the past, particularly in the region around Baghdad, but the disease has been almost completely absent within recent YEARS.

000 years. The infection is believed to be en-
164 zootic among the field rodents in sections
133 of the eastern and the southern provinces,
505 since outbreaks have sometimes coincided with floods which caused the rats to seek shelter in the villages. It has also been introduced on occasion by way of steamer traffic through Basra and the river towns.
164 With the exception of 34 cases, associated with a localized outbreak in the vicinity of Amarah in 1945, no instance of human plague was reported from 1937 through 1952. The 1945 outbreak started in a small village on the edge of the marshes near Amarah, in which 16 cases and 4 deaths were recorded within a period of 20 days.
164 Quarantine measures were enforced by the
744 government health organization and the Allied military authorities. DDT spraying was resisted by the inhabitants, who fled to the marshes, and the most seriously infected village was finally evacuated and burned to the ground.

In Baghdad and Basra, captured rats are often examined for the presence of plague, but rodent control is not attempted in the various cities and towns unless an epidemic is threatened. Plague-infected rats were found in Baghdad up to 1938.

164 Relapsing Fever. Both louse-borne and tick-borne relapsing fever are sporadic: from 25 to 100 cases are usually reported each year. Small localized outbreaks of louse-borne relapsing fever occur from time to time, primarily in the northern provinces. More extensive outbreaks were recorded in 1945-47, undoubtedly part of the epidemic wave which swept through the eastern Mediterranean countries in 1942-46. According to official statistics, 243 cases were treated in government institutions in 1945, 334 in 1946 and 379 in 1947, in contrast with 52 cases in 1944 and 26 to 33 in 1948-49.

Occasional cases of tick-borne relapsing fever are encountered in northern Iraq.
● [136] *Ornithodorus tholozani* is regarded as the probable vector.

164 Leishmaniasis. Cutaneous leishmaniasis
369

164 369 is endemic in the alluvial plain region, within a radius of about 100 miles around Baghdad, which is one of the major foci in the Middle East. There the infection rates average 20 to 60 per cent, and probably approach 95 per cent in many localities, especially in the older parts of the city. Outside of this traditional focus, the infection is distributed irregularly. Some of the agricultural districts to the south are relatively free from the disease, but in the more compact towns and villages the infection rates are as high as 40 per cent. In Basra and Muntafiq *liwas*, the extent of infection is slight, and even in the towns the prevalence probably does not exceed 3 to 4 per cent. North of Baghdad the disease appears to be confined to isolated foci. It is widespread in the city of Mosul and in the towns of Beled, Samarrah and 'Aqra, but is almost completely absent from the steppe country and from the mountainous areas of Iraqi Kurdistan.

164 158 In the 6-year period 1944-49, the cases of Oriental sore treated annually in government institutions ranged between a minimum of 2,910 in 1948 and a maximum of 10,502 in 1945. All ages are affected, but most of the infections are acquired in childhood, with the greatest susceptibility between 1 and 4 years of age. Multiple lesions [514] are frequent, particularly among individuals living in congested and unhygienic surroundings. Ulcerative sores predominate, but the nodular type is seen in a large percentage of the cases. Secondary tuberculoid lesions, arising in healing ulcers, are also common in children. The largest number of cases is usually observed in August, September and October. *Phlebotomus sergenti* is apparently the only important vector in [126] Iraq, as in Pakistan. Cutaneous infections occur among the dogs and the cats found in the cities, but they are thought to play a minor role in the spread of the human disease.

164 369 Visceral leishmaniasis, or kala-azar, is suspected of being sporadic in the northern part of the country, although up to 1950